

Appl. No.: 10/823,288
Attorney Docket No.: SAR-14916A (18703-492)
Amdt. dated May 8, 2006
Reply to Office Action of February 6, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (currently amended): A light emitting device comprising:

a light output;
a light source producing light including
wavelengths of 530 nm or less; and
a wavelength transformer located between the light
source and the light output, comprising Sr_{1-x} -
 $Ca_xGa_2S_4:yEu^{2+} \cdot zGa_2S_3$, wherein:
x is 0.0001 to 1;[[.]]
y is a value defining sufficient Eu^{2+}
to provide luminescent
emission;[[. and]]
z is 0.0001 to 0.2 based on the mole
amount of $Sr_xCa_{1-x}Ga_2S_4$ [[.]]; and
the wavelength transformer
effectively to-increases the light
at the light output, the light
having a wavelength between
535 nm and 560 nm.

Claim 2. (currently amended): The light emitting device of claim 1[[6]], wherein z is 0.001 to 0.2.

Claim 3. (original): The light emitting device of claim 1, wherein z is 0.001 to 0.1.

Claim 4. (original): The light emitting device of claim 1, wherein y is 0.001 to 0.1 based on the mole amount of $Sr_{1-x}Ca_xGa_2S_4$.

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Claim 5. (original): The light emitting device of claim 4, wherein y is 0.01 to 0.08

Claim 6. (original): The light emitting device of claim 4, wherein y is 0.01 to 0.04.

Claim 7. (original): The light emitting device of claim 1, wherein the phosphor has an emission peak of 535 nm to 560 nm.

Claim 8. (original): The light emitting device of claim 7, wherein the emission peak has a bandwidth of 50 nm or less under excitation with an emission source at $440 \text{ nm} \pm 40 \text{ nm}$.

Claim 9[[8]]. (currently amended) A method of making a strontium calcium thiogallate phosphor of formula $\text{Sr}_{1-x}\text{Ca}_x\text{Ga}_2\text{S}_4:y\text{Eu}^{2+}:z\text{Ga}_2\text{S}_3$, wherein:

x is 0.0001 to 1;[[,]]

y is a value defining sufficient Eu^{2+} to provide luminescent emission;[[,]] and

z is 0.0001 to 0.2 based on the mole amount of $\text{Sr}_{1-x}\text{Ca}_x\text{Ga}_2\text{S}_4$,

the method comprising:

forming a composition of sulfate salts of gallium, divalent europium, calcium and, if x is not 1, strontium; and

firing the composition under hydrogen sulfide.

Claim 10[[9]]. (currently amended): The method of claim 9[[8]], wherein z is 0.001 to 0.2.

Claim 11[[10]]. (currently amended): The method of claim 9[[8]], wherein ~~where the an~~ amount of gallium is tuned to the range of 0.1 to 7 % in excess of the stoichiometric amount of $\text{Sr}_x\text{Ca}_{1-x}\text{Ga}_2\text{S}_4:y\text{Eu}^{2+}$.

Claim 12[[11]]. (currently amended): The method of claim 9[[8]], further comprising:
a second firing of the composition following the firing under hydrogen sulfide.

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Claim 13[[12]]. (currently amended): The method of claim 12[[11]], wherein the first firing under hydrogen sulfide is conducted at 500 to 850 degrees C.

Claim 14[[13]]. (currently amended): The method of claim 13[[12]], wherein the second firing is conducted at 750 to 950 degrees C.

Claim 15[[14]]. (currently amended): The method of claim 13[[12]], wherein the product of the first firing under hydrogen sulfide is ground prior to the second firing.

Claim 16[[15]]. (currently amended): The method of claim 9[[8]], wherein z is 0.001 to 0.1.

Claim 17[[16]]. (currently amended): The method of claim 9[[8]], wherein y is 0.001 to 0.1 based on the mole amount of $\text{Sr}_{1-x}\text{Ca}_x\text{Ga}_2\text{S}_4$.

Claim 18[[17]]. (currently amended): The method of claim 17[[16]], wherein y is 0.01 to 0.08.

Claim 19[[18]]. (currently amended): The method of claim 18[[16]], wherein y is 0.01 to 0.04.

Claim 20[[19]]. (currently amended): The method of claim 9[[8]], wherein the phosphor has an emission peak of 535 nm to 560 nm.

Claim 21[[20]]. (currently amended): The method of claim 20[[19]], wherein the emission peak has a bandwidth of 50 nm or less under excitation with an emission source at $440 \text{ nm} \pm 40 \text{ nm}$.